DESCRIPTION

Information Processing Apparatus, Information Processing Method and Recording Medium

Technical Field

This invention relates to an information processing apparatus and an information processing method adapted for detecting identification data of recording medium to store related information relating to the recording medium in correspondence with the detected identification data and to display such information on display unit, and a recording medium used in such apparatus and method.

Background Art

In the home network system such as IEEE (The Institute of Electrical and Electronics Engineers) 1394 serial bus, etc., plural electronic equipments, e.g., IRD (Integrated Receiver Decoder) and/or CD (Compact Disc) player, etc. are connected to carry out transmission/reception of information between respective electronic equipments, thus making it possible to execute reproduction or recording of information. At the IEEE 1394 serial bus, electronic equipment of the control side provides AV/C (Audio Video/Control) command with respect to electronic equipment of the side to be controlled so that the control of the electronic equipment of the side to be controlled is carried out.

Meanwhile, in the conventional home network system, user could not add,e.g., user information which are arbitrary additional information such as a peculiar title or the name of music to an unrecordable reproduction only recording medium such as CD, etc. to carry out the management of CD on the basis of the above-mentioned information.

Disclosure of the Invention

An object of this invention is to provide a novel information processing apparatus and a novel information processing method which can solve the problems that the conventional home network systems have, and a recording medium used in such apparatus and method.

In more practical sense, an object of this invention is to provide an information processing apparatus and an information processing method adapted for storing related information in correspondence with identification data of recording medium, thereby making it possible to carry out management on the basis of user information that user has added even in the case where reproduction only recording medium is employed, and a recording medium used in such apparatus and method.

The information processing apparatus according to this invention proposed in order to attain such object comprises: a detecting section for detecting identification data recorded on a recording medium; input means for inputting related information realting to the recording medium; a memory section for storing the related information

inputted by this input means in correspondence with the identification data; and a display control section for controlling display of the related information stored in the memory section.

The information processing apparatus further comprises a comparing section for comparing the identification data recorded on the recording medium and related information inputted by the input means. The comparing section controls display of related information stored in the memory section in accordance with the result of comparison between the identification data and the related information.

As the recording medium, a reproduction only type recording medium such as CD, etc. may be used.

The detecting section for detecting identification data recorded with respect to the recording medium is constituted so that detection of identification data is carried out through network.

Further, as identification data recorded on the recording medium, TOC (Table Of Contents) data may be used.

Further, the information processing method according to this invention includes: a detection step of detecting identification data recorded on a recording medium; an input step of inputting related information relating to the recording medium; a memory control step of conducting a control so as to store related information inputted by processing of the input step in correspondence with the identification data; and a display control step of controlling display of related information stored by processing

of the memory control step.

Further, this method may include a step of comparing identification data recorded on the recording medium and related information inputted by the input means.

On the recording medium used in the above-described information processing apparatus and information processing method, there is recorded a program including: a detection step of detecting identification data recorded on the recording medium; an input step of inputting related information relating to the recording medium; a memory control step of conducting a control so as to store related information inputted by processing of the input step in correspondence with the identification data; and a display control step of controlling display of related information stored by processing of the memory control step.

In this invention, the identification data recorded on the recording medium is detected and related information relating to the recording medium is inputted. The inputted related information is stored in correspondence with the identification data.

Still further objects of this invention and more practical effects achieved by this invention will become more apparent from the description of the embodiment which will be given below.

Brief Description of the Drawings

FIG. 1 is a block diagram showing the configuration of the network system

according to the present invention.

FIG. 2 is a block diagram showing an example of the configuration of IRD constituting the network system shown in FIG. 1.

FIG. 3 is a block diagram showing an example of the configuration of CD player constituting the network system shown in FIG. 1.

FIG. 4 is a view for explaining a software stack stored on hard disc shown in FIG. 2.

FIG. 5 is a view for explaining install operation of DCM and FCM.

FIG. 6 is a flowchart for explaining related information input processing.

FIG. 7 is a view for explaining GUI displayed on LCD.

FIG. 8 is a view for explaining GUI displayed when pull-down key shown in FIG. 7 is operated.

FIG. 9 is a flowchart showing input operation procedure of title.

FIG. 10 is a view for explaining GUI displayed when an icon for selecting editing picture shown in FIG. 7 is operated.

FIG. 11 is a flowchart for explaining another example of the related information input processing.

FIG. 12 is a flowchart for explaining reproduction processing of a predetermined recording track of CD.

Best Mode for Carrying Out the Invention

FIG. 1 is a block diagram showing a home network system in accordance with this invention. To IEEE 1394 serial bus 1, an IRD 2 as controlling equipment and a CD player 3 as a controlled equipment which is controlled by this IRD 2 are connected.

While there is shown the example where the CD player 3 is connected to the serial bus 1 as controlled equipment, other controlled equipments may be further connected.

When the CD player 3 is connected to the IEEE 1394 serial bus 1, it transmits DCM (Device Control Module) and FCM (Function Control Module) which will be described later to the IRD 2 through the IEEE 1394 serial bus 1. The IRD 2 detects a connecting state of equipments connected to the IEEE 1394 serial bus 1 from the DCM and the FCM which are received information to allow a LCD (Liquid Crystal Display) 29 (see FIG. 2) which is a display unit within which GUI (Graphical User Interface) for controlling such equipments is included to carry out display.

A user operates a touch panel 28 (see FIG. 2) attached to the IRD 2 on the basis of the display of the LCD 29 to instruct the processing that the CD player 3 connected to the IEEE 1394 serial bus 1 executes. The IRD2 generates a control signal on the basis of the instruction from the user and delivers the control signal to the CD player 3 through the IEEE 1394 serial bus 1. The CD player 3 carries out processing, such as, for example, reproduction of musical data, etc. on the basis of the inputted control signal.

The IRD 2 is constituted as shown in FIG. 2, for example. A signal transmitted

from the CD player 3 is inputted to a CPU (Central Processing Unit) 23 through the IEEE 1394 serial bus 1, an IEEE 1394 interface 21 and an internal bus 22. Further, when the touch panel 28 is operated by user, a command corresponding to that operation is inputted to the CPU 23 through an input/output interface 27 and the internal bus 22. In this example, the touch panel 28 can be operated in accordance with message displayed on the LCD 29.

It is to be noted that while the touch panel 28 is used for the purpose of inputting operation command in this embodiment, means for attaining this operation is not limited to the touch panel 28, but operation keys and/or a keyboard on which a large number of operation keys are arranged, etc. may be used.

The CPU 23 functions as a control unit for controlling the entirety of the IRD 2. This CPU 23 reads out program stored in a ROM 24 in accordance with the inputted signal, executes the program, and output its processing result to the LCD 29 through the input/output interface 27 as occasion demands to allow the LCD 29 to display the processing result. The CPU 23 further generates character/picture data indicating such a message to assist operation of user and outputs such data to the LCD 29 through the internal bus 22 and the input/output interface 27 to allow the LCD 29 to display it, or generates a control signal for controlling the CD player 3 to transmit the control signal to the CD player 3 through the internal bus 22, the IEEE 1394 interface 21 and the IEEE 1394 serial bus 1. A RAM 25 temporarily stores data generated by execution of program of the CPU 23 and/or data required for allowing

the CD player 3 to execute processing.

An antenna 11 receives, e.g., signal of satellite broadcast wave and delivers the received signal to a tuner 26 of the IRD 2 The tuner 26 receives a signal of broadcast channel instructed from the CPU 23 among the received signals of satellite broadcast waves received by the antenna 11. On a hard disc (HD) 30, various applications or middle-wares, etc. that the CPU 23 executes are stored. At a drive 31, there can be mounted a magnetic disc 41, an optical disc 42, a magneto-optical disc 43, or a semiconductor memory 44, etc.

The CD player 3 connected to the IEEE 1394 serial bus 1 and controlled by the IRD 2 has a configuration as shown in FIG. 3.

A signal transmitted from the IRD 2 is inputted to a CPU 53 through the IEEE 1394 serial bus 1, an IEEE 1394 interface 51 and an internal bus 52. Further, when user operates the CD player 3 by using touch panel 58, a signal corresponding to the operation by user is inputted to the CPU 53 through an input/output interface 57 and the internal bus 52.

It is to be noted that operation means used for operating the CD player 3 is not limited to the touch panel 58, but operation keys, etc. may be used.

The CPU 53 provided at the CD player 3 reads out program stored in a ROM 54 on the basis of inputted signal, executes the program, and outputs, e.g., a control signal through the internal bus 52 to a reproduction processing section 56, or transmits its own DCM and FCM stored in the ROM 54 to the IRD 2 through the internal bus

52, the IEEE 1394 interface 51 and the IEEE 1394 serial bus 1. A RAM 55 temporarily stores data generated by the execution of program by the CPU 53 and/or data required for allowing the CD player 3 to execute the processing.

The reproduction processing section 56 of the CD player 3 reads data, e.g., musical data recorded on loaded media (not shown), CD in this example on the basis of control signal inputted from the CPU 53, and transmits such data to the IRD 2 through the internal bus 52, the IEEE 1394 interface 51 and the IEEE 1394 serial bus 1, or outputs data which has been read to a loudspeaker included therewithin to reproduce it. The reproduction processing section 56 further detects TOC (Table Of Contents) data from the reproduction data and outputs it to a LCD 59 through the internal bus 52 and the input/output interface 57 to allow the LCD 59 to display its content as visible information. In this example, as the TOC data displayed on the LCD 59 as a display unit, there are total number of recording tracks formed on CD and total data quantity of the recording tracks, etc. In this case, the total data quantity is displayed by time.

In this embodiment, in order that equipments on the network as shown in FIG. 1 operate in cooperation with each other, middle-ware for control and management of network is required. In this case, the middle-ware is a software positioned between low order software such as OS, network control program or data base system, etc. and high order application and serving to provide various services with respect to the application. Further, in order that the network normally operates so that mutual use

of equipments is carried out even in the case where equipment of different maker is connected to the network, a common specification to which the middleware should conform to is indispensable. Here, explanation will be given in connection with the network in the case where HAVi (Home Audio/Video Interoperability Architecture) (Trade Name) is applied as the middleware for control and management of network.

FIG. 4 shows an example of the software stack stored on the hard disc 30 provided at the IRD 2 shown in FIG. 2. In FIG. 4, modules shown at upper side are caused to be layer of higher order with respect to modules shown at lower side. The portions except for 1394 driver, Application and Attributes List are software modules corresponding to HAVi.

The 1394 driver is a module in which the portion dependent upon the IEEE 1394 serial bus 1 is described, and is a software for providing common procedure for device access with the high order software. The CMM (Communication Media Manager) 1394 serves as an interface between the IEEE 1394 serial bus 1 and respective software modules and the applications of the HAVi. The CMM 1394 provides transmission mechanism for carrying out transmission/reception of signals among equipments connected to the IEEE 1394 serial bus 1, and grasps the operating state of the IEEE 1394 serial bus 1 to offer its information to other software modules.

A messaging System serves as API (Application Programming Interface) for allowing software modules of respective equipments on the network to communicate with each other, and performs a role to carry out transmission of message among

software modules. For this reason, in the network where HAVi is employed, the side which transmits message and the side which receives message can carry out the transmission of message without recognizing mutual locations on the network.

A DCM Manager serves to install DCM and AVDISCFCM which will be described later with respect to respective equipments on the network. In the network employing HAVi, DCM Manager installs DCM and AVDISCFCM in newly connected equipment when new equipment is connected to the network, and uninstalls DCM and AVDISCFCM from disconnected equipments when equipment is disconnected from the network.

An event manager performs a role to generate event in the case where the state of the network is varied, e.g., as the result of the fact that new equipment is connected to the network or equipment is disconnected therefrom to carry out transmission to other software modules. Thus, in the network employing HAVi, plug and play can be realized.

A registry serves to hold or update information relating to equipment, e.g., which equipment is connected on the network or which function corresponding equipment has, etc., and permits interaction among different equipments. Application program obtains necessary information from this registry. In addition, respective equipments on the network can confirm location of basic software modules of other equipments on the network by making reference to the registry.

A Stream Manager serves to carry out monitoring and management of stream

data such as video or audio data, i.e., a flow of continuous data on the network, thus to permit real time transmission of the stream data. Further, the Stream Manager carries out management of connection within the equipment and among equipments, carries out the insurance or release of network resource and provides of the connection information of the entirety of network. In addition, the Stream Manager can also support re-connection after bus reset of the network.

A Resource Manager processes a collision problem of device use rights, carries out the management of scheduled events such as the processing reserved at connected equipment, etc., or carries out monitoring e.g., the presence or absence of detachment of registered device, etc.

Application serves to detect identification data of data recorded on recording medium such as CD, etc. loaded on equipments such as CD player, etc. connected to the network to execute the judgment processing as to whether or not there is the same identification data in the attributes list. The detail of the attributes list will be described later.

DCM serves to carry out the control of equipments, and is installed from the CD player 3. Application program does not directly control respective equipments connected to the network, but carries out the control of respective equipments through corresponding DCMs. The AVDISCFCM is installed from the CD player 3, and represents contents or functions of controls that the application program executes with respect to respective equipments to transmit AV/C command to the equipments

designated by the DCM. Since the DCM and the AVDISCFCM function as API, there is no necessity that Application program itself takes differences among individual equipments into consideration. Accordingly, in the network employing HAVi, the equipment on the network can recognize the function of other equipment, thus making it possible to operate other equipment from remote places.

Attributes List is constituted as indicated below, for example.

Attributes List {

Unique ID [ ]:

Attributes Data [ ]

}

Attributes Data {

Title:

Title Description:

Artist:

Image:

Track [ ]

TrackDescription [ ]

}

In this attributes list, ID for media recognition is stored at Unique ID [ ]:, and Attributes data (related information) relating to media is stored at AttributesData [ ]. Further, a title is stored at Title: in AttributesData, a description of title is stored at

Title Description, an artist is stored at Artist, an image file, etc. are stored at Image, a track title, e.g., music name and time is stored at Track [ ], and a track description is stored at Track Description [ ] therein.

Software modules as described above are possessed, in accordance with class of equipment prescribed at HAVi, at respective equipments connected to the network. In the HAVi, classes of the following four kinds of equipments are prescribed.

FAV (Full AV Device) assumes equipment having a function to carry out management of the network, and is provided with all software modules of the above-described HAVi. Additionally, there are instances where FAV does not possess DCM and AVDISCFCM, but FAV can be installed from, e.g., BAV which will be described later. FAV can execute Application using JAVA (Trade Name) employed as HAVi byte code. Accordingly, FAV can possess DCM and FCM of other equipment, and possesses DCM and FCM of other equipment, thereby making it possible to place other equipments under control.

IAV (Intermediate AV Device) assumes the equipment having a function to carry out management of network similarly to FAV. However, since IAV has the environment where Application using JAVA employed as HAVi byte code cannot be executed unlike the FAV, it assembles thereinto DCM, FCM of other equipments in advance.

BAV (Base AV Device) assumes controlled equipment which can be directly connected to the network of HAVi, and possesses the own DCM and FCM. LAV

(Legacy AV Device) has only function as an equipment which can be connected to IEEE 1394 serial bus 1. However, since LAV copes with AV/C command, it operates as the controlled equipment while it operates by itself.

In this invention, explanation will be given on the assumption that IRD 2 is an equipment corresponding to FAV (IEEE 1394 interface 21 is an equipment corresponding to CMM 1394) and CD player 3 is an equipment corresponding to BAV. As shown in FIG. 5, IRD 2 serving as FAV installs DCM and AVDISCFCM of CD player 3 serving as BAV, thereby making it possible to place the CD player 3 under control.

The related information input processing that the IRD 2 executes will now be described.

Initially, the explanation will be given with reference to FIG. 6 in connection with the case where the IRD 2 serving as a controlling equipment selects CD the player 3 as a controlled equipment and selects CD as reproduction only recording medium. In this example, the IRD 2 is activated. Thus, e.g., device select picture is displayed on the LCD 29 serving as the display unit and the selection of CDs is carried out.

Although detailed explanation is omitted, respective software modules of the software stack which have been described with reference to FIG. 4 are read out from the hard disc 30 and sent to the CPU 23 and are executed at the CPU23.

First, in the related information input processing, as shown in FIG. 6, Application makes a request to AVDISCFCM for notification of insertion of CD. At

step S2, in the case where CD is inserted, AVDISCFCM makes a request for notification of event indicating that insertion with respect to event manager. Further, AVDISCFCM acquires state of CD player 3 through the Messaging System and the CMM 1394.

In this case, since CD is selected as device, display picture for operating CD player 3 as user interface (UI) is displayed on the LCD 29 at step S3. As the display form, there is used a display form as shown in FIG. 7.

At step S4, whether or not CD is inserted into the CD player 3 is discriminated. In the case where CD is not inserted into the CD player 3, processing in this case is completed. When it is detected that CD has been inserted into the CD player 3, the application transmits, at step S5, HAVi message of AVDISC: get_TOC to AVDISCFCM to make a request for acquisition of TOC data recorded on the CD. At step S6, the AVDISCFCM makes a request to the CD player 3 for sending of TOC data recorded on the CD. When the CPU 53 provided in the CD player 3 receives request from AVDISCFCM, it controls the reproduction processing section 56 at step S7 to reproduce TOC data recorded on the CD. The CPU 53 reads detected TOC data to transmit it to AVDISCFCM. While the request for TOC data is made in this invention, acquisition request for CD_ text data, etc. in which music name of album, etc. is included may be made.

At step S8, AVDISCFCM transmits received TOC data to the application. At step S9, Application compares TOC data received from AVDISCFCM with TOC data

in Attributes data already stored in Attributes List to judge whether or not they coincide with each other, i.e., whether or not there is the TOC data in which total number of tracks and data quantity of respective tracks, e.g., reproduction time are the same. In this case, the TOC data is used for identifying CD. In the case where identification information exists in addition to the above, such identification information may be used.

In the case where it is judged at the step S9 that received TOC data and TOC data in attributes data stored in the Attributes List coincide with each other, the processing procedure proceeds to step S10. Thus, the application reads thereinto Attributes data corresponding to the TOC data which has coincided from the attributes list to allow the LCD 29 to display its content to complete a series of processing. In this case, GUI as shown in FIG. 7 is displayed on the LCD 29.

At this time, the application transmits HAVi message, e.g., defined as below to AVDISCFCM to make a request for acquisition of at title, a title description, an artist, a track title, a track description and an image file stored in attributes data corresponding to TOC data in attributes list. Accordingly, GUI shown in FIG. 7 is displayed on the LCD 29 as the result of the transmission of these messages.

AVDISC: get_Title

AVDISC: get_Title_Description

AVDISC: get_Artist

AVDISC: get_Track

AVDISC: get_Track_Description

AVDISC: get_Image

At display column 61 of FIG. 7, track No. being selected and length of data of that track, e.g., playing time are displayed. In this case, immediately after attributes data are read, the first track No. is selected. In the example shown in FIG. 7, it is displayed that time of the first track is 12 minutes 5 seconds at present. In this example, as time displayed at the display column 61 at the time of reproduction, intermediate time during reproduction is displayed. Moreover, at a display column 68, a title is displayed. At a display column 69, an artist is displayed. Further, at a display column 70, a track title is displayed.

Further, when a pull-down key 71 within GUI shown in FIG. 7 is pressed by the user, a list box 81 is displayed as shown in FIG. 8. The user moves a cursor 82 in upper and lower directions to select other tracks.

When either one of icons 62 to 66 is touched by the user, the application sets AVDISCFCM to either one of operation modes of Play state, Pause state, Stop state, Reverse state and Forward state. In addition, when the icon 67 is touched by the user, the application can eject CD. Namely, when the the icons 62 to 66 are touched by the user, the application respectively outputs, e.g., HAVi messages defined as below to AVDISCFCM.

AVDISC:Play

AVDISC:Pause

AVDISC:Stop

AVDISC:Reverse

AVDISC:Forward

When AVDISCFCM receives such message from the Application, it respectively outputs AV/C commands of (Play, Pause, Stop, Reverse, Forward, Eject) through the internal bus 22, the IEEE 1394 interface 21 and the IEEE 1394 serial bus 1. The CD player 3 receives these AV/C commands to carry out predetermined processing, e.g., Play, Pause, Stop, Reverse, Forward and Eject.

Further, when an icon 72 is touched by user, the application allows GUI to switch into edit picture which will be described later. When an icon 73 is touched, the application closes GUI.

Returning to FIG. 6, in the case where it is judged at step S9 that TOC data in Attributes data stored within Attributes List and received TOC data do not coincide, i.e., in the case where it is judged that related information of that CD is not yet stored within the Attributes List, the processing procedure proceeds to step S11. The application allows display columns 68 to 70 of GUI shown in FIG. 7 to be blank to display attributes data Table.

The operation procedure that the user inputs the related information such as title, etc. after processing of step S10 or step S11 shown in FIG. 6 will now be described with reference to FIG. 9.

In the state where operation procedure for carrying out input operation of

related information by user is selected, there results the state where GUI shown in FIG. 7 is displayed on the LCD 29 at step S21 shown in FIG. 9 via the above-described procedure shown in FIG. 6.

Then, at step S22, the user judges whether or not the related information such as title, etc. is inputted. In the case where it is judged that the related information such as title, etc. is inputted, the user touches the icon 72 shown in FIG. 7, i.e., the editing icon 72 for the purpose of displaying editing picture.

When the editing icon 72 is operated, the processing procedure shifts to step S23. At the step S23, the Application serves to display, e.g., GUI as shown in FIG. 10. The GUI shown in this FIG. 10 is the editing picture in which the related information such as title, etc. is inputted.

It is to be noted that in the case where the editing icon 72 is not operated, display state of GUI shown in FIG. 7 is caused to be continued.

When GUI shown in FIG. 10 is displayed at the step S23, inputting of the related information such as title, etc. is carried out by the user at step S24. At this step S24, by using a keyboard displayed on the touch panel 28, user can input a title at an input column 91, input a title description at an input column 92, input an artist name at an input column 93, input a track title at an input column 94 and input a track description at an input column 95. Moreover, at an input column 96, image file which is picture image data, etc. is attached. As an acquisition method for picture image data, e.g., there is a method of down-loading picture image data that the record company,

etc. delivers from Web, or the like. In this example, the input column 91 is linked with the display column 68 (see FIGS. 7 and 8), the input column 93 is linked with the display column 69, and the input column 94 is linked with the display column 70. When, e.g., text data is inputted to the input the columns 91, 93, 94, such input data are displayed at the display the columns 68 to 70.

When the user inputs a title, etc. on the basis of GUI shown in FIG. 10 at step S24 shown in FIG. 9 and presses an icon 97 for confirmation shown in FIG. 10, i.e., establishment of input is carried out at step S25, the application transmits HAVi message defined as below, for example, to AVDISCFCM to make a request for setting of attributes data of the title, title description, artist name, track title, track description and image file in the attributes list.

AVDISC:set_Title

AVDISC:set_Title_Description

AVDISC:set_Artist

AVDISC:set_Track

AVDISC:set_Track_Description

AVDISC:set_Image

At step S26, the application stores the content of attributes data (related information) inputted at the step S24 into the Attributes List to complete processing.

When input establishment is not carried out at step S25 and cancel icon 98 shown in FIG. 10 is operated, GUI shown in FIG. 10 is caused to be editing picture for

permitting the input of related information such as title, etc. In this case, the state may return to the state for displaying GUI of step S21.

Moreover, in the case where it is judged at the step S22 that the title, etc. are not inputted, the operation procedure returns to the step S21 as described above to continue the display state of GUI shown in FIG. 7.

While the processing is started from the state where the controlled equipment is not selected at IRD 2 in the related information input processing shown in FIG. 6, there are instances where CD player 3 may be selected in advance as the controlled equipment. In this case, input processing of related information is carried out via procedure as shown in FIG. 11.

Namely, in the case where CD player 3 is selected in advance as the controlled equipment, when CD is loaded into the CD player 3 at step S31 as shown in FIG.11, Event Manager is informed that CD has been inserted at step S32. When the Event Manager receives response from the CD player 3, it notifies to Application at step S33 that CD has been inserted. Since the same procedure as that of the step S5 and steps subsequent thereto at subsequent times is taken, the detailed explanation is omitted.

The procedure of reproduction processing of music data recorded at predetermined recording tracks of CD will now be described with reference to the flowchart of FIG. 12.

In order to carry out reproduction of music data recorded on the CD, the CD is inserted into the CD player 3, and processing at the steps S1 to S10 shown in FIG. 6

are already executed. Now, there results the state where GUI shown in FIG. 7 is displayed on the LCD 29.

When user operates the pull-down key 71 at step S41, Application allows the LCD 29 to display the list box 81 shown in FIG. 8. User moves cursor 82 in upper and lower directions to select recording track at which music data to be reproduced is recorded. Further, user operates icon 62 for selecting reproduction operation mode to designate reproduction of that recording track with respect to the CD player 3.

At step S42, the application transmits, on the basis of designation of user, HAVi message of AVDISC:Play to AVDISCFCM to notify reproduction of selected track. At step S43, the AVDISCFCM receives message from the application to output AV/C command of Play to the CD player 3 through the internal bus 22, the IEEE 1394 interface 21 and the IEEE 1394 serial bus 1 to notify reproduction of selected recording track.

At step S44, when the CPU 53 receives notification from the AVDISCFCM to control the reproduction processing section 56, the CD player 3 reproduces selected recording track. At step S55, the application judges whether or not stop is instructed by user, i.e., whether or not icon 64 for stopping reproduction shown in FIG. 7 is operated, or judges whether or not the reproduction of corresponding recording track is completed. As a result, in the case where all judgments are No, the processing procedure returns to the step S44 to repeat the above-described processing.

At step S55, in the case where either judgment is Yes, the processing procedure

proceeds to step S46. Thus, the application judges whether or not reproduction of different recording track is designated by user. As a result, in the case where it is judged that reproduction of different recording track is designated, the processing procedure returns to the step S42 to repeat the above-described processing subsequent thereto. On the other hand, in the case where it is judged that reproduction of different recording track is not designated, the processing is completed.

As described above, such an approach is employed to store user information such as title or description, etc. of CD inserted into the CD player 3 of the controlled side (BAV) as attributes data in attributes list of IRD2 of the control side (FAV), whereby even in the case where unrecordable reproduction only CD is employed, it is possible to carry out management on the basis of related information that user has added. Namely, the information processing apparatus of this invention is used, whereby user can listen to music of CD while looking at his favorite picture, and user reads out impression that he has previously experienced with respect to respective pieces of CD album, thereby making it possible to carry out program selection of only his favorite pieces to listen to them.

While explanation has been given by taking as example the case where a CD is reproduced in the above-described description, this invention can be applied to, e.g., a reproduction only DVD (Digital Versatile Disc), etc.

Furthermore, e.g., in the case where magneto-optical disc player using a magneto-optical disc of the recording/reproduction type as recording medium is

connected to the IEEE 1394 serial bus 1 disc to carry out, onto the magneto-optical disc, dubbing of data of CD inserted in the CD player 3, the magneto-optical disc player can carry out dubbing of stream data caused to flow from the CD player 3 and record attribute data (related information) caused to flow from IRD 2. Accordingly, user is not required to input title, etc. onto the magneto-optical disc for a second time.

A software for executing the above-described series of processing is installed from recording medium to computer in which program constituting its software is assembled into dedicated hardware, or, e.g., widely used personal computer, etc. which can execute various functions by installing various programs, etc.

This recording medium is constituted as shown in FIG. 2 not only by hard disc 30 on which there is recorded program offered to user in the state assembled into the IRD 2 in advance, but also by package media using magnetic disc 41 such as floppy disc, etc. on which program distributed for offering to user separately from the IRD 2 is recorded, a CD-ROM (Compact Disc-Read Only Memory), an optical disc 42 such as DVD, etc. a magneto-optical disc 43, or a semiconductor memory 44 which is solid-state memory, etc.

In addition, in this invention, steps for describing program recorded on the recording medium includes not only processing carried out in a time series manner along the described order, but also processing executed in parallel or individually even if such processing is not necessarily processed in a time series manner.

It is to be noted that, in this invention, the system represents the entirety of the

apparatus composed of plural units.

Industrial Applicability

As described above, this invention adopts such an approach to detect the identification data recorded on recording medium to input related information relating to the recording medium to store inputted related information in the identification data. Accordingly, even in the case where reproduction only recording medium is employed, it is possible to carry out management on the basis of user information such as a title or an artist name, etc.